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**SOURCE IDENTIFICATION**      Captured German documents. (Information specifically requested.)

## USSR PETROLEUM EXTRACTION AND REFINING

## INTRODUCTION

This is a compilation of extracts from a series of petroleum reports found in captured German documents. Most of these reports were prepared by the economic staffs of the armies and army groups and especially the petroleum exploitation teams (Mineralöl Kommandos) who were responsible for the exploration and utilization of all available petroleum wells and refineries and reported their investigations to the German High Command.

Inasmuch as most of the intelligence on petroleum production from available German documents has already been extracted this report will supplement information on: (1) the petroleum wells and refineries in east Galicia; (2) the petroleum wells on the Taman Peninsula; (3) the Kaluzhskaya oil fields of the Maikop oil region; and (4) the Batumi and Kau refineries. In addition one German document gave valuable data on the Soviet efforts to increase oil production during the last year of World War II.

Shortly after the German troops advanced into Russia in July 1941, a petroleum-exploitation team investigated the petroleum region of eastern Galicia (GHS Document No W1/ID 2.152). Its geological survey, dated 12 July 1941, identified the following zones running in a northwest-southeast direction: (1) the Magura stratum, (2) the central depression, (3) the Skila region, (4) the zone of deep folds, (5) the Stebnik anticlinorium, (6) the Tortonice syncline, and (7) the Tortonice plateau.

The most significant deposits were located in the zone of deep folds which is situated in the northwestern and southeastern extensions of the productive Borislav deposits. The following wells were investigated:

1. Volanka Wells No 1 and 2 near Borislav, which will exploit a second deep deposit. By now July 1941 the Volanka Well No 1 has reached a depth of only 650 meters, while any geological result can be expected only at 1,000 meters and a profitable exploitation at 1,500 to 2,000 meters.

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2. Lukavichi Well which is located northwest of Borislav, near Monasterets and has basically the same purpose as the Volanka Well No 1. This well has not yet been sunk deep enough to record any significant geological results.

3. Igubenets Wells No 1, 2, and 3 which are located southeast of Borislav and are to explore the extensions of the Borislav deposits between Borislav and Rypne. The Igubenets Well No 1 has already been sunk through the first fold; however any significant geological results have not yet been recorded because the well has not been sunk deep enough.

4. Skoroche Well No 1 which is located in the central depression zone, in the southeastern extension of the west-Galicia oil deposits. It will explore the productivity of the underlying Krosno strata. The total depth of this well is supposed to reach 1,700 meters, while at present only 200 meters have been drilled.

The zone of deep folds contains at present the main productive oil deposits, such as Borislav, Drogozych, Dolina, Rypne, Dzwyniaz, Bitkov, and Madvornaya. If the new deep deposits can be explored, this zone will become by far the most promising region of east Galicia. During the Soviet occupation, production in east Galicia declined considerably. Only with the utmost efforts can the output of the old deposits be kept on the previous level; at the same time, this may curtail any intensive exploration. It would be more important to explore the deeper deposits located in the zone of deep folds inasmuch as the temporary decrease of production would soon be adjusted by the exploration of new petroleum deposits.

A report by a petroleum-exploitation team, dated 2 July 1941 (GND Document No W1/V1.142), listed the following yearly production figures of the Drogozych oil region (in tons):

Near Borislav, Mramica, Tuzcanovichi	246,264
Near Urych	7,849
Near Shodnica, southwest of Borislav	39,536
North of Lisko, near Tirava Solna	2,522
Northeast of Likso Ropienka and Lessczovate	21,190
North of Stary Sambor Strzelbice	2,210
Southeast of Lisko, near Czarna	19,507
Southeast of Lisko, near Lipa	585
Southeast of Stanislaw, near Rypne	13,458
Southeast of Stanislaw, near Maydan	3,466
Southeast of Stanislaw, near Bitkov	25,061
Southeast of Delyatin, near Sloboda-Rumurskaya	1,543
Total	384,191

The Oberkommando der Wehrmacht, Wirtschafts-Rüstungsamt (Economic and Armament Office of the Armed Forces) reported on the significance of the occupied Soviet territories, on 5 July 1941, and summarized the output of the Drogozych petroleum region as follows (GND Document No OKW/687):

The petroleum extraction of 388,000 tons per year in the Drogozych region equals 1.1 percent of the total Soviet production and approximately 8 percent of Greater Germany's production of derivatives.

#### Petroleum Extraction

	<u>Tons per Year</u>
Borislav region	295,000
Ropienka region, east of Lisko	43,000
Region of Rypne, Maydan, Bitkov, Delyatin	50,000
Total	388,000

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The crude-oil wells were not destroyed according to reports available to the Germans.

#### Petroleum refining

<u>Location</u>	<u>Tons per Year</u>
Borislaw, Drogobych Oblast	12,000
Drogobych, " "	250,000
Derezhytse, " "	12,000
Hubyche, " "	20,000
Rykhohits, " "	30,000
Stary, " "	10,700
Usokyki, " "	43,000
Bolekhov, Stanislaw Oblast	9,600
Madvornaya, " "	8,000
Stanislaw, " "	9,600
Lwov, Lwov Oblast	42,000

The last annual output of the above-mentioned refineries and gasoline installations, including Charnovitsy was as follows (in tons):

Gasoline	135,000
Kerosene	168,000
Gas and fuel oil	96,000
Lubricating oil	48,000
Paraffin	24,000
<b>Total</b>	<b>471,000</b>

According to reports available to the Germans, the refineries in Drogobych, with the exception of the "Galicia" Refinery, as well as the gasoline installation in Borislaw which processed natural gas, are destroyed. It may be expected, however, that one of the destroyed refineries in Drogobych (with a capacity of 50,000 tons per year), as well as the Borislaw gasoline installation (with a capacity of 32,000 tons per year), will be able to resume operations by the end of July [1941].

If the refineries of the area that are still in working condition are unable to process the supplies on hand and the incoming crude oil, these quantities of crude oil will have to be sent to the refineries of the General Government for processing.

The Wirtschafts-Inspektion Süd (Economic Staff of Army Group South) reported the following on petroleum extraction and processing in Galicia on 8 July 1941 (GNDG Documents No WI/VI.142):

#### a. Petroleum Production in Borislaw

In Borislaw only part of the drilling equipment was destroyed or damaged. The oil installations can be restored within a comparatively short time inasmuch as the wells themselves were not destroyed. Production, which amounted to approximately 17,000 tons per month before the war, is estimated to be approximately 10,500 tons per month at present and will be increased to 80 percent of the former output within 8 days. Original production can be reached in 4 to 6 months after replacement of some of the completely useless machinery.

The Borislaw power plant was completely demolished, it had a capacity of 50,000 kilowatts, burned natural gas, and supplied power for the drilling machinery, waterworks, and the city. At present the drilling installations are supplied by the Drogobych power plant.

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## b. Refineries in Drogobych

The large and modern distilling installations and refineries of the "Nafta," "Galicia," and "Polmin" Plants in Drogobych were extensively destroyed. The crude oil reached these plants via pipe lines, which were not damaged, and in tank cars.

The restoration of the installations of the "Nafta" Refinery which were entirely destroyed cannot be considered. Some storage tanks and the administration building were not damaged.

In the "Galicia" Plant, most of the boilers and turbines were intact. The old refinery operated again on the second day of the German occupation; the operation of the old distilling installation, which had not been used for 5 years, will start within the next few days. Gasoline, and Diesel and lubricating oil are being produced at present.

The modern parts of the "Polmin" Refinery were also completely destroyed. Only an old distilling installation with a boiler house was not damaged. It supplies the adjacent paraffin factory.

Besides the three larger refineries mentioned above there were about 45 smaller refineries with insignificant capacities in and near Drogobych. This team suggested that the undamaged machinery be removed from these numerous small plants and be used for the completion and enlarging of the "Galicia" and "Polmin" Refineries.

## c. Lvov Refinery

The refinery in Lvov was completely destroyed and could be used only as a depot.

## d. Ustrzyki Dolne Region

The petroleum region near Ustrzyki Dolne will continue to produce its monthly capacity of 2,100 tons since its installations were not damaged. Processing of the crude oil took place in the distilling installations of Ustrzyki Dolne which were also found intact. Since the capacity of these installations amounted to 4,000 tons monthly, 2,000 tons of petroleum can be processed as soon as the railroad connection from Borislav is restored.

On 16 August 1941, a petroleum-exploitation team published the following information about petroleum production and processing in east Galicia (GMS Document No W1/VI.141):

According to previous reports, an average of 23,500 tons of petroleum will be produced monthly in the three oil-producing regions of Borislav, Stanislaw, and Van-kova from August to December 1941, a total production of 115,000 tons during this period. This amount would have to be processed by the nearby refineries, because continuous accumulation of unprocessed products at the oil fields or refineries would greatly delay the production.

The intake of the following refineries was estimated to be 76,500 tons of crude oil, provided that the accumulated unprocessed products were processed immediately:

"Polmin" Refinery	Intake (tons)
4,000 tons per month (August to November)	16,000
In December, after restoration of damaged paraffin factory	8,000
Total (August to December)	24,000

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**"Galicia" Refinery****SECRET**

Intake (tons)

7,000 tons per month (August to December)

35,000

**"Ustrzyki" Refinery**

3,500 tons per month (August to December)

17,500

Because of the shortage of storage facilities at the oil fields and at the refineries, the remaining 40,000 tons of petroleum should be processed at the west Galician refineries in Jaslo, Glinik, and Trzebinia.

The various oil fields of the Maikop region were also subjected to an extensive exploitation program by the German occupational forces.

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The following report of the "Taman" exploitation team, dated 3 June 1943, may indicate the potentialities of the Taman Peninsula oil fields (GMS Document No W1/ID 2.707). Petroleum production in May 1943 was as follows (in tons):

<u>Well No</u>	<u>Type</u>	<u>Production</u>
<u>Malikhovo</u>		
9	Gusher	1.1
12	Gusher	14.5
13	Gusher	7.0
<b>Total</b>		<b>22.6</b>
<u>Kraslarovo</u>		
45	Gusher	2.2
58	Bailing	3.4
59	Bailing	1.6
67	Gusher	36.7
89	Gusher	3.4
<b>Total</b>		<b>47.3</b>
<u>Anapaki</u>		
70	Bailing	20.9
<u>Adagum</u>		
2	Bailing	11.3
6	Bailing	1.8
7	Bailing	2.1
8	Bailing	5.5
10	Bailing	14.7
11	Bailing	17.7
15	Gusher	12.9
17	Bailing	7.5
19	Bailing	.7
20	Bailing	.8
21	Gusher	7.6
24	Gusher	30.9
27	Gusher	7.0
34	Gusher	39.7
38	Gusher	7.2
39	Gusher	9.1
43	Bailing	8.9
46	Bailing	4.5
<b>Total</b>		<b>209.6</b>
<b>Grand Total</b>		<b>300.7</b>

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Another report by the Maikop II petroleum-exploitation team, dated 28 November 1942, gave the output of the Kaluzhskaya oil fields as follows (GMS Document No W1/ID 2.452):

The daily production amounted to 15 to 18 tons of petroleum with 24 productive wells, of which seven operated by pumping and the remainder by bailing. The following individual wells were identified:

Well No	Production	Type
10/8	2 tons daily	Pumping
11/8	0.5 ton monthly	Bailing
20/8	1 ton daily	Latently clogged by sand
32/26	1 ton daily	Pumping
60/28	4 tons daily	Often cleaned of sand
2/29		Bailed occasionally
1/71	1 ton daily	Pumping
153/94	1.5 tons daily	
157/94	2 tons daily	
158/94	3.5 tons daily	
54/94	0.5 ton monthly	Bailing
55/94	0.5 ton monthly	Bailing
165	1 ton monthly	Bailing
166	4 tons monthly	Bailing
167	8 tons monthly	Bailing

The following report by the Oberkommando der Wehrmacht/Wirtschaftsamt (Economic Staff of the Armed Forces), dated 17 July 1942, corrected information pertaining to Batumi and Baku refineries (GMS Document No W1/ID 2.174).

The "Stalin" Petroleum Refinery in Batumi consists of the following installations:

1. Foster system installation, processing of Baku crude oil into approximately 5 percent gasoline, 25-30 percent kerosene, lubricating oil, and asphalt.
2. Boiler battery installation, processing Baku crude oil into gasoline, kerosene, lubricating oils.
3. Jenkins system cracking installation, processing mazut accumulated by the two above-mentioned installations into pressed distillates, 800 tons daily.
4. Winkler-Koch system cracking installation, also processing mazut accumulated by the first two installations into pressed distillates, 1,000 tons daily.
5. Installation for the purification of distillation products, presumably also production of aviation gasoline, employs 2,000 workers.

The Batumi refinery plants form a complex, designated as "BNZ imeni Stalina" (Batumi Naphtha Plants imeni Stalin) and are not, as it was supposed until now, two refineries, "BNZ and "Stalin."

The refineries do not process 8 million tons per year, but 3-4 million tons per year.

The following refineries are located in Baku:

1. "Sadenny" Plant, producing benzene, toluol, xylol, naphthalene and coko.

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2. "Andreyev" Plant, producing gasoline, aviation gasoline, kerosene, mazut, solar oil.
3. "Dzhaparidze" Plant, producing lubricating oils, aircraft engine oils, white naphthalenes.
4. "Stalin" Plant, producing gasoline, ligroine, kerosene, lubricating oils, mazut, asphalt.
5. "Vana Sturua" Plant, producing pressed distillates and cracking gasolines.

The largest refineries in the Soviet Union are located in Baku. Their capacity is estimated at 15 million tons per year, processing 60 percent of the crude-oil output in the Baku area. The five pipe installations alone processed 1,300,000 tons each or a total of 6.5 million tons per year.

The remainder of the Baku petroleum is being processed mainly in Batumi (an estimated 3-4 million tons per year) and in Grozny (an estimated 4-5 million tons per year). The capacities of the various refineries, however, cannot yet be considered reliably determined.

The information available concerning the refineries in Baku must be considered obsolete.

The "October Revolution" Refinery was incorporated into the "Stalin" Plant. A "Voroshilov" Refinery does not exist. The Factory of the Azerbaijan Petroleum Institute is only a school and research installation. The separately identified "Nine Boilers and Pipe Distillation" Plant is not an independent plant; it has been identified as being in both the "Stalin" Plant and in the "Andreyev" Plant. The Wilke pipe distillation installation belongs to the "Andreyev" Plant, and the "Alco" oil-distilling installation to the "Stalin" Plant. The presumption of 22 existing refineries in Baku is inaccurate. There are the five refinery units mentioned above with numerous installations distributed throughout the White City and the Black City of Baku.

The following items from various official Soviet reports and newspaper extracts compiled by the Germans (GRMS Document No R3/365) discuss the Soviet efforts to achieve an increased petroleum output during the last year of World War II.

According to one report, the German High Command summarized the Soviet petroleum economy as follows:

Production in 1944 amounted to 37 million tons. Although the percentage of Caucasian petroleum in relation to the total production decreased because of the increased production of other petroleum areas, it still amounted to 63 percent of the 1944 output. The Volga-Ural region accounted for about 20 percent of the 1944 production. At present the refinery capacity is adequate inasmuch as new cracking installations employing American methods have been introduced.

A November 1944 report stated that with the restoration of the Caucasian petroleum production, the output of the Baku region was to increase to 25 million tons, and the Maikop and Grozny regions were to produce 2 million tons. The "Leninpet" was the first of the "Amerit" Petroleum Combine to fulfill the 1944 plan. It produced 29,000 tons more than in 1943. Geologists discovered rich petroleum deposits on the bottom of the Caspian Sea, and new drillings were carried out to exploit them.

An article in Pravda, 4 December 1944, revealed that in the Volga-Ural oil region, the number of oil wells in Ryznyubov Oblast was to increase one and one-half times, and in the case of the "Kinel'neft" Combine, 35 percent. Geological investigations were

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started in the southern part of this oblast, while the exploration of the Devonian deposits in the Gubinsk, Yablony, and Solonensk oil fields has been terminated. With utilization of the present wells and the restoration of these inactive wells, it was expected to raise production 85 percent by the end of 1945. The petroleum industry in Kuybyshev Oblast produced 25 percent more petroleum in the first half of 1944 than in the same period in 1943; by the end of 1944 it had yielded 22 percent more than planned.

According to a December 1944 report, a second well was drilled on the Devonian strata of Tyumazy and its 1,700-meter-deep gusher produced 100 tons of petroleum daily. At the newly discovered oil deposits near Gubino (Samarskaya Luka), the second well has produced its first crude oil and has a daily capacity of 80 tons.

On 7 September 1944 Krasnaya Zvezda reported that a new well of the "Ishimbay-Koif" Trust was producing 130 tons daily. In January 1945 it was reported that the petroleum refinery in Kryazh near Kuybyshev was being constructed under the supervision of American engineers.

An August 1944 report indicated that in the Emba oil region, high-grade petroleum deposits had been discovered near Kashkar, north of the Caspian Sea. The first five wells, which were drilled to a depth of 750 feet, showed productive gushers. It is estimated that 50 oil wells can be drilled in this already explored region. In Kashkar a reservoir, a 10-kilometer pipe line, and a workers' settlement are being constructed. The German Economic Staff commented that Kashkar, 10 kilometers northeast of Makat, is located in the middle of the thoroughly explored Emba oil region. This deposit is now being exploited and the 15-kilometer-long pipe line leads to the main pipe line Guryev-Orsk.

A December 1944 report stated that a new petroleum region had been discovered near Andishan, Fergana Oblast, Uzbek SSR, and a new well was in operation there. Furthermore, a powerful gusher came in on the Palvan-Tash oil field, and two other wells had started operations.

According to a December 1944 report a petroleum deposit is to be explored 2 kilometers from Glavnyy Stan (2,000 inhabitants), 15 kilometers from the Japanese border, on Sakhalin. It is planned to erect 30 derricks with a total capacity of 2,000 tons per year. The German Economic Staff concurs with this information inasmuch as the entire eastern coastal region from the northern tip to the Japanese border (300 kilometers) has been known as oil-productive, and petroleum has been produced in Ketangli and Aleksandrova on the western coast. It is very possible that the high-grade oil supplies of 318 million tons in Soviet Sakhalin are now being exploited extensively.

In Komi ASSR in November 1944 800 derricks were to be erected near Ukhta. In addition a report dated October 1944 stated that the oil refineries of Ukhta have recently been expanded and produced 2,250,000 tons from 1 January 1944 to 31 May 1944.

The German Economic Staff warns that this latter information should be treated with great caution. According to an earlier report from Turkey, the cracking plant in Ukhta, under construction since 1942, has a capacity of 5 million tons and produced 4,250,000 tons during the first 8 months of 1943. One should consider that millions of tons of crude oil would have to be shipped to Kotlas by rail and water and then via the inefficient Kotlas-Ukhta-Vorkuta railroad line, already heavily burdened by shipment of Vorkuta coal, in order to achieve the alleged capacity of 5 or more million tons per year. Because of the close guard over the Ukhta petroleum industry by the NKVD, any intelligence about this remote region has been very vague. It is estimated that the petroleum output in 1944 may have amounted to 500,000 tons at the most.

In November 1944 a reliable source reported that Moscow planned the construction of a large refinery in Batumi, and gave the following reasons: (1) Batumi has

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been overburdened as the petroleum center; it would also be more practicable to disperse the petroleum installations, thus preventing their complete destruction in case of war; (2) Batumi can supply, via sea routes, the entire Ukrainian industry; and (3) Batumi is better located for overseas shipments than the ports of Tsaape and Novorossiysk inasmuch as the latter must obtain the crude oil from Grozny.

The German Economic Staff's added comment to such a plan was that the USSR would not want to have the Turkish border only 6 kilometers south of the projected petroleum center of Batumi, and would insist upon the return of the area of Kars as well as the southern part of Batumi Oblast which was ceded to Turkey. For the transportation of crude oil the construction of a third pipe line between Baku and Batumi was planned. The erection of the refinery was to start in February 1946 and the capacity of this installation was to amount to 2 million tons.

It was also planned to build an expensive railroad line from Batumi to Kars and Dzhulfa (located on the old Caucasian-Iran border), provided that Turkey would be forced to return the Kars region. This railroad line was to serve as the shortest connection between northern Iran and Batumi for the most expedient shipping of north Iranian products to south USSR ports and any overseas destination via Batumi. At present Batumi is barred from any overseas shipping in spite of large expansions since June 1941, especially since Soviet war and merchant ships took refuge in Batumi after the loss of Sevastopol.

An October 1944 report noted that the new refinery in Ussol'ye, 70 kilometers northwest of Irkutsk, was finished in January 1943, and since March 1943 had been producing aviation gasoline by processing crude oil from the Ussol'ye oil fields and Sverdlovsk storage tanks. The latter is a more productive and high-grade oil than the Ussol'ye petroleum. The refinery is equipped with a three-column distilling installation and employs 1,000 workers, mostly women and minors, in two 12-hour shifts.

The German Economic Staff commented that the petroleum deposit near Ussol'ye had been known for some time, although there had been no information pertaining to its reserves, production, and characteristics. It seems doubtful whether aviation gasoline is actually being produced inasmuch as this fact is based on interrogation of prisoners of war. It is more likely that this refinery is an evacuated older-type installation which supplies the neighboring regions with automotive gasoline, ligroine, and heating fuel oil, and possesses only a limited capacity.

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